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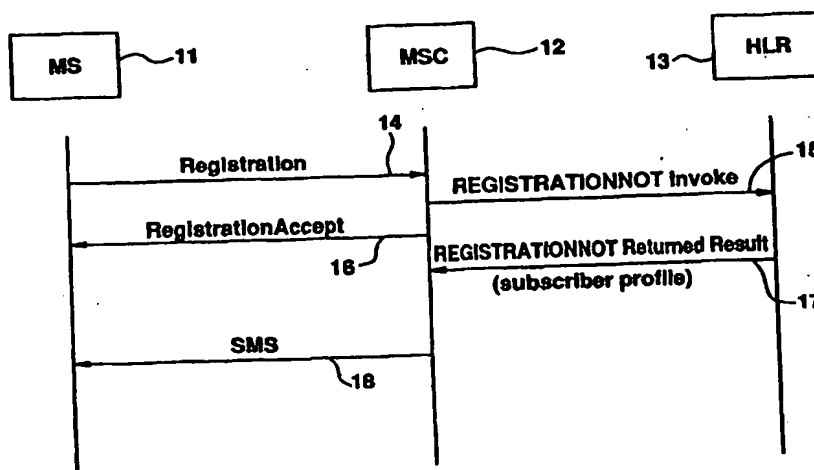
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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/SE97/01802 (22) International Filing Date: 28 October 1997 (28.10.97) (30) Priority Data: 08/744,221 15 November 1996 (15.11.96) US (71) Applicant: TELEFONAKTIEBOLAGET LM ERICSSON (publ) [SE/SE]; S-126 25 Stockholm (SE). (72) Inventor: FOTI, George; 2967 Lake Road, Dollard des Ormeaux, Quebec H9B 2M1 (CA). (74) Agent: TELEFONAKTIEBOLAGET LM ERICSSON; Patent and Trademark Dept., S-126 25 Stockholm (SE).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>  (88) Date of publication of the international search report: 17 September 1998 (17.09.98)

(54) Title: SYSTEM AND METHOD OF TEMPORARILY CHANGING SUBSCRIBER SERVICES IN A RADIO TELECOMMUNICATIONS NETWORK



(57) Abstract

A system and method of accessing and changing a subscriber service in a radio telecommunications network. The network includes a mobile station (32), a mobile switching center (MSC) (36) having a temporary subscriber record (40), and a home location register (HLR) (37) for storing the subscriber service in an original state. The mobile station transmits to the MSC, a request to change the subscriber service from the original state to a changed state. The request includes an indication that the change request is temporary. The MSC (36) then changes the subscriber service to the changed state in the temporary subscriber record (40) in the MSC. If the MSC subsequently receives a request to make the change request permanent, the MSC transmits the change request to the HLR (37) which enters the change in a permanent subscriber profile (39). If the change request remains temporary, it remains in the temporary subscriber record (40) and is discarded a predetermined time period after the subscriber deactivates the mobile station (32). The status of the subscriber service thus automatically reverts to the original state whenever the subscriber re-activates the mobile station.

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# INTERNATIONAL SEARCH REPORT

International Application No

PCT/SE 97/01802

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 6 H0407/38 H0407/22 H0407/24

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	WO 93 07566 A (MOTOROLA INC) 15 April 1993 see page 4, line 10 - page 5, line 20  see page 18, line 26 - page 20, line 33; figure 7 ---	1, 15 2-14, 16-18
A	US 5 353 340 A (KUNZ DAVID P) 4 October 1994 see column 3, line 30 - column 4, line 10 see column 4, line 50 - column 6, line 43 ---	1-18
A	WO 94 21075 A (NOKIA TELECOMMUNICATIONS OY ; SUIKKOLA RAUNO (FI); TOEYRYLAH HANNU) 15 September 1994 cited in the application see column 6, line 32 - column 9, line 15; figure 2 -----	1

☐ Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

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Date of the actual completion of the international search

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

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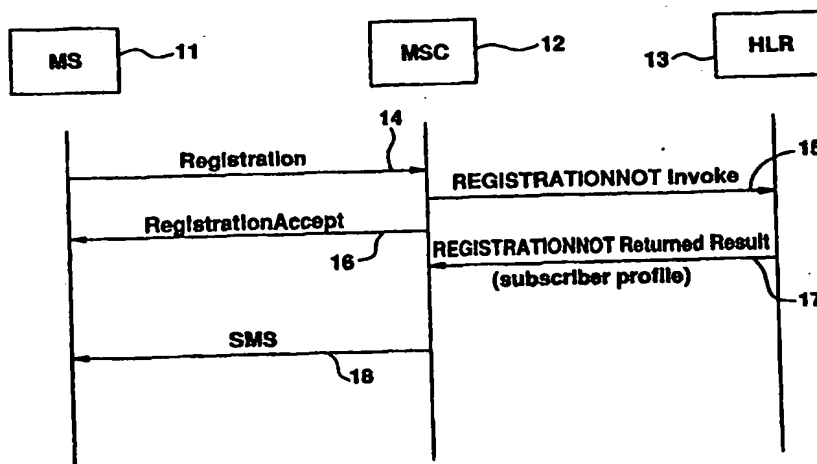
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## SYSTEM AND METHOD OF TEMPORARILY CHANGING SUBSCRIBER SERVICES IN A RADIO TELECOMMUNICATIONS NETWORK

### 5 RELATED APPLICATIONS

This application is a Continuation-In-Part of co-pending U.S. Patent Application Serial Number 08/401,884 filed March 10, 1995, now abandoned.

### BACKGROUND OF THE INVENTION

#### 10 Technical Field of the Invention

This invention relates to radio telecommunication systems and, more particularly, to a system and method of temporarily changing subscriber services in a radio telecommunications network.

#### Description of Related Art

15 In modern radio telecommunication networks, the networks are divided into cells which service a defined area for mobile stations. Each cell contains a base station which transmits and receives voice and control information to and from mobile stations (mobile phones) which are located within the cell's coverage area. Each of the cells employs a separate control channel for relaying control information  
20 to mobile stations, and voice channels for relaying voice information.

The control channel, whether analog or digital, performs the function of providing access for mobile subscribers to services provided by cells within a cellular telecommunications network. Analog control channels are described in the Advanced Mobile Telephone Service (AMPS) or IS-553 analog air interface  
25 specification which is hereby incorporated by reference herein. The current version of the cellular industry standard for a Digital Control Channel (DCCH) is described in Project No. 3011-2 of the EIA/TIA Interim Standard IS-54-C, "Cellular System Dual-Mode Mobile Station - Base Station Compatibility Standard", dated April 8, 1994. The IS-54-C specification comprises two distinct parts:

30 IS-54.1 - This part specifies the operation of the digital control channel and is organized in accordance with the general concept of protocol layering; and

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IS-54.2 - This part specifies the modified operation of the analog control channel and traffic channels required in support of new functionality, such as short message service (SMS) operation.

The IS-54-C specification, including IS-54.1 and IS-54.2, is hereby incorporated by reference herein.

Today's standards offer mobile telephone subscribers a great deal of flexibility in transferring calls to other numbers. For example, a subscriber may transfer a call to fixed number services, variable number services, or voice mail transfer services. Each of these call-transfer services has a different priority, thus allowing subscribers to assign different forward-to numbers (C-numbers) to different call-transfer services, depending on the priority they desire.

Flexibility, however, also results in complexity in existing cellular telephone systems. In addition to assigning a call-transfer service for each C-number, subscribers must also individually activate or deactivate each call-transfer service. Many subscribers may forget the current state of their call-transfer services (i.e., whether a particular call-transfer service has a C-number assigned; if so, which C-number is assigned; and whether the call-transfer service is activated or deactivated). To obtain status information of call-transfer services, subscribers must call their telephone service provider and request an agent to access their profile and tell them the current status. Instead, subscribers sometimes try to guess the current state, and if a subscriber guesses wrong, calls may be missed or routed to the wrong C-number.

Additionally, whenever a subscriber changes anything in his subscriber profile, the changes are made in his home location register (HLR). These changes are considered "permanent" because they remain in the selected state until another positive action is taken by the subscriber to change the services again. Sometimes, however, a subscriber may wish to change his services on a temporary basis. For example, when a subscriber travels for a limited period of time to another location other than his home area, and that location is serviced by a new exchange, he may wish to temporarily activate call forwarding or change his call forwarding telephone number. When the subscriber activates call forwarding, even if the subscriber is in



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the new location for only a few hours, the service change is made in the subscriber profile in the HLR. Thus, the change is a permanent change. Therefore, when the subscriber wants to de-activate call forwarding, he must again request to have his services changed. In addition, the subscriber incurs increased cost whenever a visited exchange has to signal the subscriber's HLR to update his profile.

Although there are no known prior art teachings of a solution to the aforementioned deficiency and shortcoming such as that disclosed herein, a number of prior art references exist that discuss subject matter that bears some relation to matters discussed herein. Such prior art references are U.S. Patent Numbers 5,181,239 to Jolissaint; U.S. Patent Number 5,043,983 to Dorst et al.; International Patent Application WO 94/21075 by Suikkola et al.; and UK Patent Application GB 2,244,409A by Elder. Each of these references is discussed briefly below.

U.S. Patent Number 5,181,239 to Jolissaint (Jolissaint) discloses a method and apparatus in a wireline telephone system which maintains a database record relating to a caller at a switching machine. Portions of the caller information may be visually displayed to agents on display telephones attached to the switch. However, Jolissaint does not in any way teach or suggest a method by which a mobile subscriber may access and retrieve his subscriber services information and display such information on the subscriber's own telephone. In addition, Jolissaint does not teach or suggest a method of temporarily changing subscriber services which does not require the subscriber to access and change his services, both upon activation and de-activation of a change. Finally, Jolissaint is limited to a wireline telephone system, and does not suggest how such a method could be implemented in a cellular telephone system.

U.S. Patent Number 5,043,983 to Dorst et al. (Dorst) discloses a system in which an intelligent telephone is connected to a central telephone office over an integrated services digital network (ISDN) basic rate interface (BRI). At the conclusion of an operator-assisted call, a data block comprising time and charges information is sent over the BRI to the intelligent telephone. The telephone then displays this information on a visual display to the caller. Dorst, however, is limited to a wireline telephone system, and does not suggest how such a system

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could be implemented in a cellular telephone system. In addition, Dorst does not teach or suggest any method of retrieving other subscriber information such as the status of call-transfer services. Finally, Dorst does not teach or suggest a method of temporarily changing subscriber services which does not require the subscriber to access and change his services twice, once upon activation and once upon de-activation of a change.

International Patent Application WO 94/21075 by Suikkola et al. (Suikkola) discloses a method in a radio system of informing subscriber stations of the facilities (services) activated therefor. The activated services are read from a subscriber database, and are sent to the subscriber station in a facility data message via a radio path. The subscriber station receives the facility data message and presents the information to the subscriber. The facility data message may be sent upon demand by the subscriber, or may be periodically sent automatically by the radio system. Suikkola, however, does not teach or suggest a method of temporarily changing subscriber services which does not require the subscriber to access and change his services twice, once upon activation and once upon de-activation of a change.

UK Patent Application GB 2,244,409A by Elder (Elder) discloses a radio communication system with a messaging center connected to each base station for storing incoming messages for a mobile station utilizing the communication system. Whenever the mobile station switches on and performs a registration update, the messaging center sends any stored messages to the mobile station. Elder, however, does not in any way teach or suggest a method by which a subscriber may access and retrieve his subscriber services information. In addition, Elder does not teach or suggest a method of temporarily changing subscriber services which does not require the subscriber to access and change his services twice, once upon activation and once upon de-activation of a change.

Review of each of the foregoing references reveals no disclosure or suggestion of a method such as that described and claimed herein.

It would be a distinct advantage to have a system and method in a radio telephone network for enabling a mobile subscriber to retrieve the current status of his subscriber services, display the current status of the subscriber's services on the

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subscriber's mobile telephone display, change services on a permanent basis in the subscriber's profile, and temporarily change subscriber services without requiring the subscriber to access and change his services twice, once upon activation and once upon de-activation of a change. The present invention provides such a system and method.

### SUMMARY OF THE INVENTION

The present invention is a system and method of providing a subscriber in a cellular telephone network with information from a subscriber service profile, and enabling the subscriber to change his services on a temporary basis. The network includes a mobile station having a visual display, a mobile switching center (MSC), and a home location register (HLR) for storing permanent subscriber service profile information. The MSC maintains a temporary subscriber record, including a temporary subscriber profile, while the mobile station is active in the service area of the MSC. When the mobile station first transmits a request for its service profile information to the MSC, the MSC retrieves the service profile information from the HLR and creates a temporary record for the subscriber. Thereafter, the subscriber may change his services in the temporary record in the MSC. Subsequent requests for permanent service profile information from the HLR do not overwrite the temporary record. The service profile information is appended to a short message service (SMS) message which is transmitted from the MSC to the mobile station. The service profile information is then displayed on the visual display of the mobile station.

When the subscriber requests a service change and indicates that the service change is temporary, the MSC recognizes that the change is temporary and stores the change in the subscriber's temporary record in the MSC without affecting the permanent subscriber profile in the HLR. If no further changes are made, the change remains in effect as long as the mobile station is active in the service area of the MSC. When the mobile station becomes inactive, the temporary change is discarded by the MSC along with the subscriber's temporary record. Thereafter, the status of the subscriber's services automatically reverts to the status in the subscriber

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profile in the HLR. Alternatively, the subscriber may send an additional feature code to the MSC before going inactive, requesting that the changes be made permanent. The MSC then sends the changes to the HLR for entry in the subscriber's permanent profile.

5           Thus, in one aspect, the present invention is a method of changing a subscriber service in a radio telecommunications network from an original state to a changed state and back to the original state. The network includes a mobile station, a mobile switching center (MSC) having a temporary subscriber record, and a home location register (HLR) for storing the subscriber service in the original  
10           state. The method begins by transmitting, from the mobile station to the MSC, a request to change the subscriber service from the original state to the changed state, and including in the request an indication that the change request is temporary. This is followed by changing the subscriber service to the changed state in the temporary subscriber record in the MSC. Finally, this is followed by automatically changing  
15           the subscriber service back to the original state whenever the mobile station becomes inactive. Alternatively, the step of changing the subscriber service to the changed state in the temporary subscriber record in the MSC may be followed by requesting that the subscriber service stored in the HLR be changed to the changed state.

          In another aspect, the present invention is a system for changing a subscriber  
20           service in a radio telecommunications network from an original state to a changed state and back to the original state. The network includes a mobile station, a mobile switching center (MSC) having a temporary subscriber record, and a home location register (HLR) for storing the subscriber service in the original state. The system includes means for transmitting, from the mobile station to the MSC, a request to  
25           change the subscriber service from the original state to the changed state. The change request includes an indication that the request is temporary. The system also includes means for changing the subscriber service to the changed state in the temporary subscriber record in the MSC, and means for automatically changing the subscriber service back to the original state whenever the mobile station becomes inactive. The  
30           means for automatically changing the subscriber service back to the original state whenever the mobile station becomes inactive may be deactivated at the subscriber's

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request by a means for changing the subscriber service stored in the HLR to the changed state through feature codes.

## BRIEF DESCRIPTION OF THE DRAWINGS

5           The invention will be better understood and its numerous objects and advantages will become more apparent to those skilled in the art by reference to the following drawing, in conjunction with the accompanying specification, in which:

FIG. 1 is a message flow diagram illustrating the messages utilized in the preferred embodiment of the present invention to retrieve a subscriber service profile upon initial registration of the subscriber;

10           FIG. 2 is a message flow diagram illustrating the messages utilized in the preferred embodiment of the present invention to retrieve a permanent subscriber service profile from the HLR or a temporary subscriber record from the MSC when a subscriber enters a feature code requesting the permanent service profile or temporary subscriber record;

15           FIG. 3 is a simplified block diagram of the system for temporarily changing subscriber services in the preferred embodiment of the present invention; and

FIGS. 4A-4B are a flow chart illustrating the steps in the method of according to the teachings of the present invention.

## 20           DETAILED DESCRIPTION OF EMBODIMENTS

In the system of the present invention, short message service (SMS) update messages, with current feature setting information, are received by mobile telephone subscribers. The subscribers can then review their subscriber profile, as contained in the update message, and ensure that the settings meet their current needs. If a subscriber's needs differ, the subscriber may change his current settings in order to avoid missing calls or routing calls to the wrong C-number, for example.

The SMS update message is sent to the subscriber under the following circumstances:

- 30           (1) Upon initial power-on registration of the subscriber's mobile telephone;

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- (2) Whenever a subscriber makes a change to a feature; or
- (3) Whenever a subscriber requests to see his temporary record or permanent service profile information by entering a feature code through his mobile station.

5           Although the preferred embodiment of the present invention retrieves and displays the status of call-transfer services, it should be understood that this embodiment is exemplary only, and the invention is not limited to the retrieval and display of call-transfer services, but may retrieve and display other types of information as well. In addition, the invention is not limited to visually displaying  
10           the information to the subscriber, but may also relay the information to the subscriber by voice message or other suitable means.

          FIG. 1 is a message flow diagram illustrating the messages utilized in the preferred embodiment of the present invention to retrieve a subscriber service profile upon initial registration of the subscriber. The messages are sent between a mobile  
15           station (MS) 11, a mobile switching center (MSC) 12, and a home location register (HLR) 13, all of which are well known in the art. The HLR 13 includes a database of subscriber information, including the status of various call-transfer services, which may be retrieved as a subscriber profile.

          When the mobile station 11 is first turned on, it transmits a registration  
20           request message 14 to the MSC 12 serving the mobile station's operating area. The registration request message 14 includes an identification of the mobile station 11. The MSC 12 sends a REGISTRATIONNOT Invoke message 15 to an associated HLR 13 to ascertain the status of the subscriber associated with the mobile station 11 requesting registration. The MSC 12 also returns a RegistrationAccept message  
25           16 to the mobile station 11. The HLR 13 notifies the MSC 12 whether or not the subscriber is an authorized user in a REGISTRATIONNOT Return Result message 17.

          In the preferred embodiment of the present invention, several additional steps are taken in order to automatically provide the subscriber with the status of call-  
30           transfer services upon registration. First, the HLR 13 appends subscriber profile information, including call-transfer service status, to the REGISTRATIONNOT

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Return Result message 17 returned to the MSC 12. Thereafter, the MSC 12 sends a short message service (SMS) message 18 to the mobile station 11. The SMS message 18 includes call-transfer service status information which is then displayed on the mobile station's visual display for the subscriber.

5           FIG. 2 is a message flow diagram illustrating the messages utilized in the preferred embodiment of the present invention to retrieve a permanent subscriber service profile from the HLR or a temporary subscriber record from the MSC when a subscriber enters a feature code requesting the permanent service profile or temporary subscriber record. FIG. 2 also illustrates the message flow when a subscriber makes  
10 a change to a feature or service stored in the HLR 13. Like FIG. 1, the messages in FIG. 2 are sent between a mobile station (MS) 11, a mobile switching center (MSC) 12, and a home location register (HLR) 13. Initially, a subscriber desiring to retrieve his permanent service profile enters an applicable feature code 21 requesting service profile information stored in the HLR 13. The feature code 21  
15 is transmitted from the mobile station 11 to the MSC 12. The MSC 12 responds by sending a FEATREQ Invoke message 22 to the associated HLR 13 requesting that the profile of subscriber features be returned. The HLR 13 responds by returning to the MSC 12 a FEATREQ Return Result message 23 to which the HLR has appended the requested subscriber profile information. The MSC 12 then sends the  
20 permanent profile information to the MS 11 in a SMS message 25. The SMS message 25 includes service status information which is then displayed on the mobile station's visual display for the subscriber.

          If the subscriber enters a feature code at 21 that requests a change in the permanent subscriber profile, the MSC 12 responds by sending a FEATREQ Invoke  
25 message 22 to the associated HLR 13 requesting that the applicable features be changed as requested. The HLR 13 makes the change, if able, and returns to the MSC 12 a FEATREQ Return Result message 23 to which the HLR has appended revised subscriber profile information. The MSC 12 then sends a success or failure tone or announcement 24 to the mobile station 11, and follows this with the  
30 permanent profile information to the MS 11 in a SMS message 25.

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The subscriber may also enter a feature code 26 which requests that a service feature be changed only in the subscriber's temporary record in the MSC 12. In this instance, the MSC 12 makes the requested change in the temporary record and returns a SMS message 27 to the MS 11 informing the subscriber of the change. No change is made to the permanent profile in the HLR 13, and the change is lost upon  
5 deactivation of the MS 11 unless the subscriber enters an appropriate feature code requesting that the change be made permanent prior to deactivating the MS 11.

FIG. 3 is a simplified block diagram of a system for temporarily changing subscriber services in the preferred embodiment of the present invention. Within  
10 a radio telecommunications network 31, a mobile station 32 communicates with a base station 33 over a radio link 34. The configuration illustrated in FIG. 3 is exemplary only, and it should be understood that in actual operation, a plurality of base stations base stations and a plurality of mobile stations would be associated with the network 31. The base station 33 includes a transmitter, receiver, antenna, and  
15 a base station controller as are well known in the art. The base station 33 is connected by a communication link 35 to a mobile switching center (MSC) 36. The relevant connections between the MSC 36 and the base station 33 are not completely shown in FIG. 3, but are well known to those of ordinary skill in the art. The MSC 36 performs radio network control and call switching functions.

The mobile station 32 is capable of initiating or receiving a telephone call  
20 through the base station 33 and the MSC 36. Such calls may be either for voice or data communications. The base station is allocated a plurality of voice or speech channels and at least one access or control channel, such as a forward control channel (FOCC). The control channel is used to control or supervise the operation  
25 of the mobile station 32 by means of information messages transmitted and received from the mobile station. Control and administration messages within the radio telecommunications network 31 are sent in accordance with industry established air interface standards, such as AMPS and EIA/TIA 553, the standards for analog cellular operations, and/or D-AMPS, IS-54B, and IS-54C, the standards for digital  
30 cellular operations, all of which are hereby incorporated by reference herein. While these standards govern operations in North America and selected other regions,



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similar standards govern other geographic areas throughout the world, and are well known to those skilled in the art.

5 The information exchanged between the base station 33 and the mobile station 32 via messages, may include incoming call signals, outgoing call signals, paging signals, paging response signals, location registration signals, voice channel assignments, maintenance instructions and handoff instructions as the mobile station travels out of the radio coverage area of the base station and into the radio coverage of another base station, as well as other additional items of information such as calling party numbers, time information, and the like. The control or voice channels  
10 may operate in either analog or digital mode or a combination thereof based upon industry standards. Integrated services between different MSCs are provided by using the intersystem specification IS-41, which is hereby incorporated by reference herein.

15 The MSC 36 is connected by signaling lines 38 to a HLR 37. The HLR stores a subscriber profile 39, location information, and status information for each mobile subscriber.

When a mobile subscriber begins to operate in the coverage area of the MSC 36, the MSC creates and stores a temporary subscriber record 40 within the MSC. The temporary subscriber record is utilized by the MSC to perform call control and  
20 switching for the mobile subscriber, while the subscriber is active in the coverage area of the MSC. If the subscriber deactivates the mobile station 32, the MSC discards the temporary subscriber record after a predetermined period of time.

FIGS. 4A-4B are a flow chart illustrating the steps in the method of temporarily changing subscriber services according to the teachings of the present  
25 invention. At step 41, the subscriber requests the status of his subscriber services. This request is transmitted via the base station for the subscriber's cell to the MSC serving the subscriber. The MSC requests the subscriber's service status from the HLR at 42. The HLR then retrieves, at step 43, the service status from the subscriber profile stored in the HLR. At step 44, the HLR sends the service status  
30 to the MSC. At 45, the MSC creates a temporary record for subscriber services and sends the service status to the subscriber. The status may be sent by voice

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announcement, by SMS message to be displayed on the display of the subscriber's mobile station, or by any other suitable device or method. Thereafter, if the subscriber requests to see the status of services in the permanent subscriber profile, the MSC retrieves the information from the HLR, and forwards the information to the subscriber, but does not overwrite any changes that have been made to the temporary record.

Following the receipt of the service status, the subscriber enters a request to change a service from an original state to a changed state at step 46. For example, the subscriber may wish to activate call forwarding or change his call forwarding telephone number. By the entry of a specified feature code, the subscriber may request that the change be either permanent or temporary. The MSC software is programmed to recognize these feature codes and to send requested permanent changes to the HLR, or to make requested temporary changes in the temporary subscriber record in the MSC. At step 47, the MSC determines whether or not the request indicates that the change is temporary. If the change is not identified as temporary, the method moves to step 48 where the MSC sends the change request to the HLR. At 49, the HLR changes the service status in the subscriber profile from the original state to the changed state. The subscriber is then notified at 50 of the permanent change. This notification may be sent as a distinctive tone, a voice announcement, a SMS message to be displayed on the display of the subscriber's mobile station, or by any other suitable device or method.

If, however, at step 47 the MSC determines that the change is temporary, the method moves from step 47 to step 51 where the MSC changes the service status in the temporary subscriber record in the MSC from the original state to the changed state. The method then moves to FIG. 4B, step 52 where the subscriber is notified of the temporary change. This notification may be sent as a distinctive tone, a voice announcement, a SMS message to be displayed on the display of the subscriber's mobile station, or by any other suitable device or method.

Any time after the MSC changes the service status in the temporary subscriber record, and before the subscriber de-activates the mobile station, the subscriber may request to make a temporary change permanent through the entry of

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a special feature code. At step 53, the MSC determines whether or not the subscriber has made such a request. If the subscriber makes a request to make a temporary change permanent, the method moves to FIG. 4A, step 48 where the MSC sends the change to the HLR for entry in the subscriber profile at 49. At step 50, the subscriber is notified that the change has been made permanent.

If, however, the subscriber does not request to make the change permanent, the method moves from step 53 to step 54 where the subscriber de-activates the mobile station. After a predetermined time period, the MSC discards the temporary subscriber record at step 55. Since the temporary service change is stored in the temporary subscriber record, the change is also discarded. Therefore, without any action on the part of the system, the status of the service automatically reverts at step 56 to the original state which is stored in the subscriber profile in the HLR. When the subscriber next activates the mobile station, the service status is in the original state.

It is thus believed that the operation and construction of the present invention will be apparent from the foregoing description. While the method, apparatus and system shown and described has been characterized as being preferred, it will be readily apparent that various changes and modifications could be made therein without departing from the spirit and scope of the invention as defined in the following claims.

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**WHAT IS CLAIMED IS:**

1. A method of accessing and changing a subscriber service in a radio telecommunications network, said network including a mobile station, a mobile switching center (MSC) having a temporary subscriber record, and a home location register (HLR) for storing said subscriber service in said original state, said method comprising the steps of:

transmitting, from said mobile station to said MSC, a request to change said subscriber service from an original state to a changed state, said request including an indication that said change request is temporary;

changing said subscriber service to said changed state in said temporary subscriber record in said MSC; and

automatically changing said subscriber service back to said original state whenever said mobile station becomes inactive.

2. The method of accessing and changing a subscriber service in a radio telecommunications network of claim 1 wherein said step of automatically changing said subscriber service back to said original state whenever said mobile station becomes inactive includes the steps of:

determining within said MSC that said mobile station is inactive;

discarding, by said MSC, the change request and the temporary subscriber record; and

automatically reverting the subscriber service to the original state of said service stored in said HLR.

3. The method of accessing and changing a subscriber service in a radio telecommunications network of claim 1 further comprising, after the step of changing said subscriber service to said changed state in said temporary subscriber record in said MSC, the step of notifying said subscriber that said change request has been entered as a temporary change.

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4. The method of accessing and changing a subscriber service in a radio telecommunications network of claim 3 further comprising, after the step of notifying said subscriber that said change request has been entered as a temporary change, the steps of:

5 determining whether said subscriber requests to make said change request permanent; and

changing said subscriber service from said original state to said changed state in said subscriber service profile in said HLR, upon determining that said subscriber requests to make said change request permanent.

10

5. A method of accessing and changing a subscriber service in a radio telecommunications network, said network including a mobile station, a mobile switching center (MSC) having a temporary subscriber record, and a home location register (HLR) for storing said subscriber service in an original state, said method comprising the steps of:

15 transmitting, from said mobile station to said MSC, a request to change said subscriber service from said original state to a changed state, said request including an indication that said change request is temporary;

changing said subscriber service to said changed state in said temporary subscriber record in said MSC;

20 determining whether or not a request is received in said MSC to make said change request permanent;

transmitting said change request from said MSC to said HLR, upon determining that a request has been received in said MSC to make said change request permanent, said HLR entering said change in a permanent subscriber profile;

25

and

automatically changing said subscriber service back to said original state whenever said mobile station becomes inactive, upon determining that a request has not been received in said MSC to make said change request permanent.

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6. A method of accessing and changing a subscriber service in a radio telecommunications network, said network including a mobile station, a mobile switching center (MSC), and a home location register (HLR) for storing said subscriber service in an original state in a subscriber service profile, said method comprising the steps of:

transmitting, from said mobile station to said mobile switching center and said home location register, a request for subscriber service profile information;

retrieving said subscriber service profile information from said home location register;

creating a temporary subscriber record in said MSC for storing subscriber service information;

appending said subscriber service profile information to a short message service (SMS) message;

transmitting said short message service message from said mobile switching center to said mobile station;

transmitting, from said mobile station to said MSC, a request to change said subscriber service from said original state to a changed state, said request including an indication that said change request is temporary;

changing said subscriber service to said changed state in said temporary subscriber record in said MSC; and

automatically changing said subscriber service back to said original state whenever said mobile station becomes inactive.

7. The method of accessing and changing a subscriber service in a radio telecommunications network of claim 6 wherein said step of transmitting a request for said service profile information includes transmitting said request upon initial power-on registration of said subscriber's mobile station.

8. The method of accessing and changing a subscriber service in a radio telecommunications network of claim 6 wherein said step of transmitting a request

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for said service profile information includes transmitting said request whenever said subscriber makes a change to a feature stored in said home location register.

5           9.     The method of accessing and changing a subscriber service in a radio telecommunications network of claim 6 wherein said step of transmitting a request for said service profile information includes transmitting said request whenever said subscriber requests to see said service profile information by entering a feature code through said mobile station.

10           10.    The method of accessing and changing a subscriber service in a radio telecommunications network of claim 6 wherein said step of automatically changing said subscriber service back to said original state whenever said mobile station becomes inactive includes the steps of:

15               determining within said MSC that said mobile station is inactive;  
discarding, by said MSC, the change request and the temporary subscriber record; and

automatically reverting the subscriber service to the original state of said service stored in said HLR.

20           11.    A method of accessing and changing a subscriber service in a radio telecommunications network, said network including a mobile station, a mobile switching center (MSC), and a home location register (HLR) for storing said subscriber service in an original state in a subscriber service profile, said method comprising the steps of:

25               transmitting, from said mobile station to said mobile switching center and said home location register, a request for subscriber service profile information;  
retrieving said subscriber service profile information from said home location register;

30               creating a temporary subscriber record in said MSC for storing subscriber service information;

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appending said subscriber service profile information to a short message service (SMS) message;

transmitting said short message service message from said mobile switching center to said mobile station;

5        transmitting, from said mobile station to said MSC, a request to change said subscriber service from said original state to a changed state;

determining in said MSC whether said change request includes an indication that said change request is temporary;

10        changing said subscriber service from said original state to said changed state in said HLR, upon determining that said change request is not temporary;

changing said subscriber service from said original state to said changed state in said temporary subscriber record in said MSC, upon determining that said change request is temporary; and

15        determining within said MSC that said mobile station is inactive; and

discarding, by said MSC, the temporary subscriber record whenever said mobile station becomes inactive.

12.    The method of accessing and changing a subscriber service in a radio telecommunications network of claim 11 wherein said step of changing said subscriber service from said original state to said changed state in said HLR, upon  
20        determining that said change request is not temporary includes the steps of:

transmitting said change request from said MSC to said HLR; and

changing said subscriber service from said original state to said changed state in said subscriber service profile in said HLR.

25

13.    The method of accessing and changing a subscriber service in a radio telecommunications network of claim 11 further comprising, after the step of changing said subscriber service from said original state to said changed state in said HLR upon determining that said change request is not temporary, the step of  
30        notifying said subscriber that said change request has been entered as a permanent change.



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14. The method of accessing and changing a subscriber service in a radio telecommunications network of claim 11 further comprising, after the step of changing said subscriber service from said original state to said changed state in said temporary subscriber record in said MSC upon determining that said change request is temporary, the step of notifying said subscriber that said change request has been entered as a temporary change.

15. A system for changing a subscriber service in a radio telecommunications network, said network including a mobile station, a mobile switching center (MSC) having a temporary subscriber record, and a home location register (HLR) for storing said subscriber service in an original state, said system comprising:

means for transmitting, from said mobile station to said MSC, a request to change said subscriber service from said original state to a changed state, said request including an indication that said change request is temporary;

means for changing said subscriber service to said changed state in said temporary subscriber record in said MSC; and

means for automatically changing said subscriber service back to said original state whenever said mobile station becomes inactive.

20

16. The system for changing a subscriber service in a radio telecommunications network of claim 15 wherein said means for automatically changing said subscriber service back to said original state whenever said mobile station becomes inactive includes:

means for determining within said MSC that said mobile station is inactive; and

means for discarding, by said MSC, the change request and the temporary subscriber record.

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17. The system for changing a subscriber service in a radio telecommunications network of claim 15 further comprising means for notifying said subscriber that said change request has been entered as a temporary change.

5 18. The system for changing a subscriber service in a radio telecommunications network of claim 3 further comprising:

means within said MSC for determining whether said subscriber requests to make said change request permanent; and

10 means for changing said subscriber service from said original state to said changed state in said subscriber service profile in said HLR, upon determining that said subscriber requests to make said change request permanent.

FIG. 1

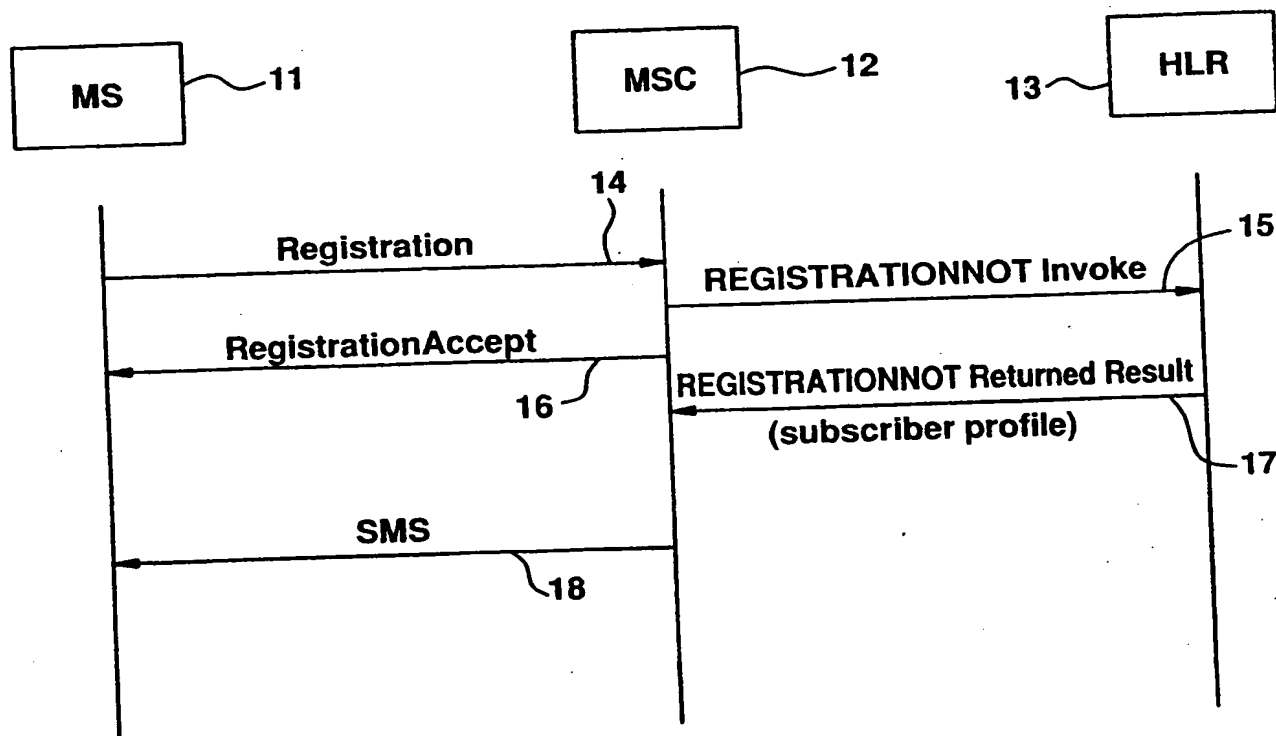


FIG.2

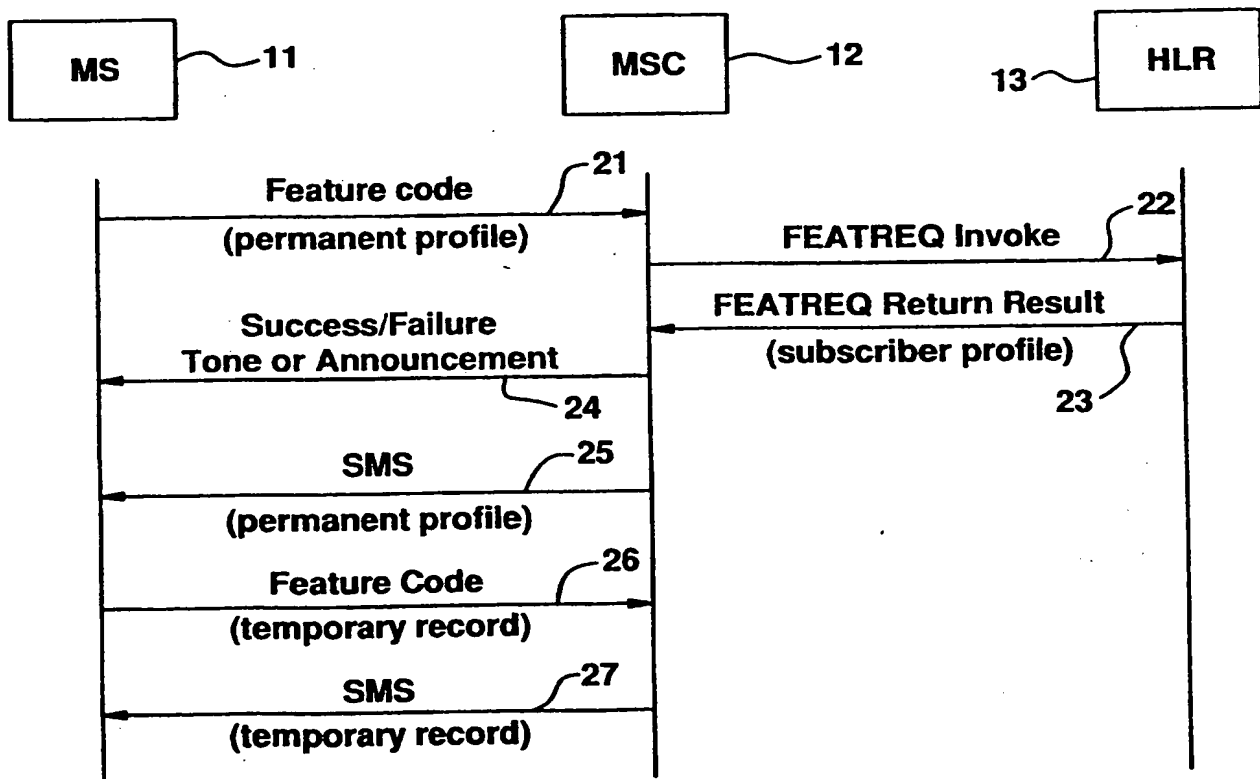


FIG.3

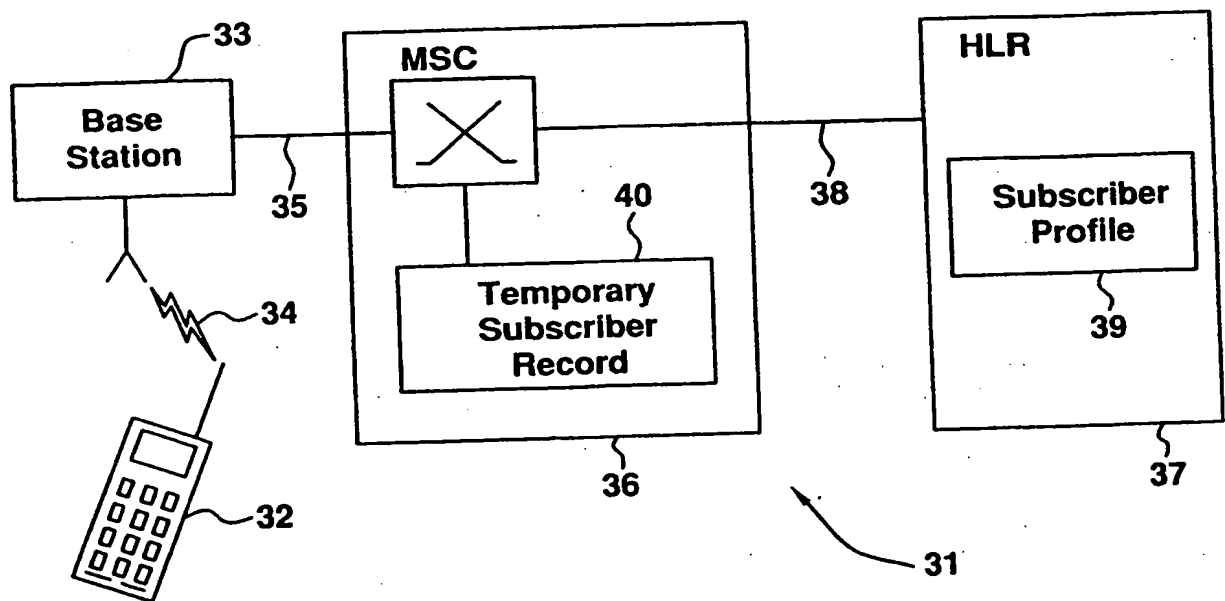


FIG.4A

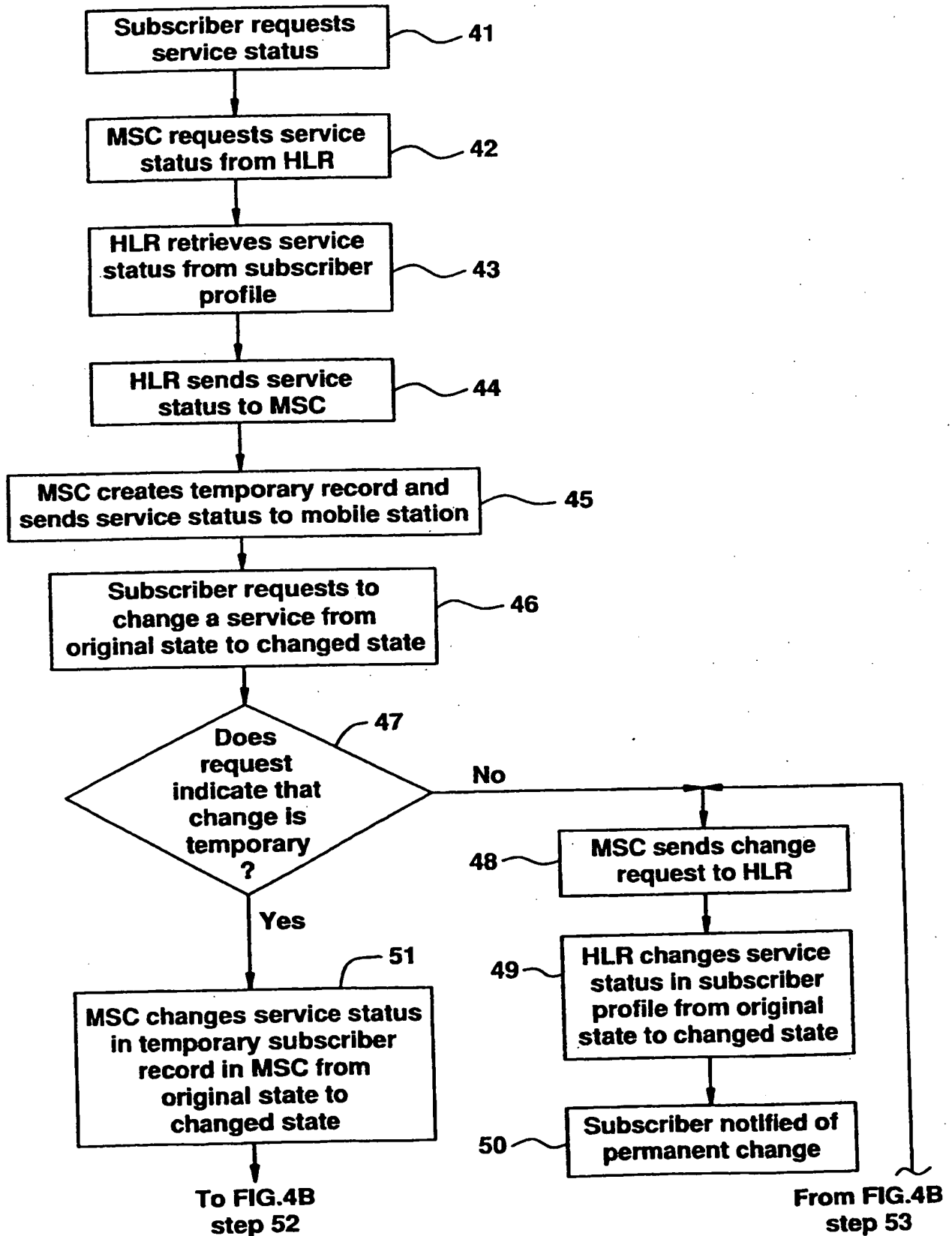


FIG.4B

